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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/643,526 | 08/22/2000 | Tongbi Jiang | 303.705US1 | 9708 |

7590

12/04/2002

Schwegman, Lundberg, Woessner & Kluth, P.A.
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| EXAMINER |
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BUI, HUNG S

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| ART UNIT | PAPER NUMBER |
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2841

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/643,526

Applicant(s)

JIANG ET AL.

Examiner

Hung S Bui

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed on 10/28/02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-15 and 20-25 is/are allowed.
- 6) ☒ Claim(s) 1-6 and 16-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juneja et al. [US 6,127,728] in view of Beck [US 2,695,351].

Regarding claims 1-2 and 4, Juneja et al. disclose a circuit board (figure 2) comprising:

- a core layer (52) having one or more fibers (column 2, lines 43-48); and
- a surface layer (50) having a surface layer thickness between about 10 and 30% of the circuit board thickness (figure 2).

Juneja et al. disclose the instant claimed invention except for the surface layer being free of fibers.

Beck discloses a multilayer circuit board (10) having a surface layer (11) formed of a resinous material free of fibers (figure 13).

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the non fiber material for the surface layer of Juneja et al., as suggested by Beck, for the purpose of facilitating application of circuit traces on the board.

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Regarding claim 5, Juneja et al. disclose the use of resin in the core material (column 2, lines 43-48).

Regarding claim 6, Juneja et al. disclose the instant claimed invention except for the specific thickness of the core layer.

The specific thickness of the core layer would have an obvious design consideration based on the amount of reinforcement necessary for the printed circuit board.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Juneja et al., as modified, as applied to claim 1 above, and further in view of Benzinger et al. [US 3,617,613].

Regarding claim 3, Juneja et al., as modified, disclose the instant claimed invention except for the surface layer being formed of a non-woven glass fiber.

Regarding claim 3, Benzinger et al. disclose the use of non-woven glass fiber (column 1, lines 57-65).

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use a non-woven glass fiber for the surface layer of Juneja et al., as modified, for the purpose of improving board flexibility.

4. Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant admitted prior art shown in a figure 1 (AAPA, hereinafter) in view of Benzinger et al., Juneja et al. and Beck.

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Regarding claim 16, AAPA discloses a circuit board assembly (figure 1) including:

- a first circuit board (105);
- a second circuit board (103) coupled to the first circuit board; and
- a die coupled to the second circuit board.

AAPA discloses the instant claimed invention except for the specific design of the second circuit board.

Benzinger et al. disclose a multiple layer circuit board (2) having a fibrous core with fibers having a diameter in the arrange of 0.2 to 14 microns (abstract lines 5-6) and the surface portion (7) located at a distance between about 10 to 20 percents of the thickness away from the number of fibers.

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the circuit board design of Benzinger et al. for the second circuit board of AAPA, for the purpose of facilitating mounting of the die.

Juneja et al. disclose a circuit board (figure 2) comprising a core layer (52) having one or more fibers (column 2, lines 43-48) and a surface layer (50) having a surface layer thickness between about 10 and 30% of the circuit board thickness (figure 2).

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use a surface layer thickness between 10% and 30% of the board thickness of Juneja et al., as modified, in AAPA, for the purpose of providing mechanical strength to the board.

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Beck discloses a multilayer circuit board (10) having a surface layer (11) formed of a resinous material free of fibers (figure 13).

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the non fiber material for the surface layer of AAPA, as modified, as suggested by Beck, for the purpose of facilitating application of circuit traces on the board.

Regarding claims 17-18, AAPA discloses the instant claimed invention except for the specific type of die mounted on the second circuit board.

The specific type of die would have been an obvious design consideration based on the intended application for the circuit board assembly.

Regarding claim 19, AAPA, as modified, disclose the instant claimed invention except for the surface layer of the second circuit board being free of fibers.

Beck discloses a multilayer circuit board (10) having a surface layer (11) formed of a resinous material free of fibers (see figure 13).

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the non fiber material for the surface layer of AAPA in view of Benzinger et al., as suggested by Beck, for the purpose of facilitating application of circuit traces on the board.

Allowable Subject Matter

5. Claims 7-15 and 20-25 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art of record does not teach or suggest the specific thickness of the outer layer of the board being between 10 to 15 percent of the total board thickness and being free of fibers.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

6. Applicant's arguments with respect to claims 1-6 and 16-19 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung S Bui whose telephone number is (703) 305-8024. The examiner can normally be reached on Monday-Friday 8:30AM-6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David S. Martin can be reached on (703) 308-3121. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0956.

HB
11/25/02

A handwritten signature in black ink, appearing to read 'D. L. A.', is positioned above the printed name and title.

DAVID MARTIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800